The First Description of a Kangaroo.

I HAVE just read in NATURE of February 26 (p. 715) a letter by Mr. W. B. Alexander concerning the discovery of Australia and the first description of a kangaroo. It is stated there that the first discovery of this animal was made, not by Sir Joseph Banks on Captain Cook's first voyage in 1770, but by Pelsart in 1629. May I be allowed to point out that a description of a kangaroo is to be found at a much earlier date, viz., in the "Decades" of Peter Martyr, published shortly after 1500. Unfortunately this book is not accessible to me at present, so I must only point to numerous publications of Mr. Edward A. Petherick, of the Federal Government Library, Melbourne, concerning the discovery of Australia, who claims this honour for Amerigo Vespucci. According to Mr. Petherick, Peter Martyr states that in 1499 a southern coast was discovered (probably by Vespucci) in which trees grew of such magnitude that sixteen men standing around one could scarcely encompass it (this would correspond to south-west Australia, between King George's Sound and Cape Leeuwin). Amongst these big trees was found a monstrous beast, with the head of a fox, the hands of a man, the tail of a monkey, and that wonderful provision of nature, a bag in which to carry its young. The beast so described was caught alive with its young, but during the long voyage both died. The carcase of the dam was taken to the Court of Ferdinand and Isabella in the year 1500. This description is not as detailed as that by Pelsart; nevertheless it cannot easily be doubted that it refers to a kangaroo, which seems to have been known for the first time so far back as the end of the fifteenth century.

The coast in question is supposed to have been discovered by Diego de Lepe, whose pilot was Vespucci.

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The Movements of Floating Particles.

WILL any physicist be good enough to explain the following to an ignorant amateur? If a clean saucer be half-filled with a decoction of tea on the surface of which bubbles or unwetted shreds of ash (as from the consumed paper round the lighted end of a cigarette) are floating but not in a continuous layer, then if the decoction, after coming to rest, be gently rocked the floating particles will partake of its perpendicular, but little, if at all, of its lateral motion. Sunken particles, on the other hand, will partake of the lateral motion. Again, if the saucer be gently tilted the fluid will flow away, but each floating particle will remain stationary, and will be deposited under its original position.

Why do not the particles partake of the lateral motion? Does the surface of the decoction form an incompressible, but flexible, film, which (in the saucer) may be added to but not subtracted from, under which the rest of the fluid slides with little friction. And when the fluid flows away does this film remain behind to form that portion of the fluid that wets the saucer? Or do solid, but invisible, particles come up and form a continuous sheet on the surface? Against the latter supposition is the fact that particles dropped on the advancing edge of the decoction remain stationary. Particles floating on the surface of ordinary tap water move with it much more freely; water in which table salt has been dissolved behaves like tap water. But even in sea water we see froth left behind by receding ripples.

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March 13.

KINEMATOGRAPHY AND ITS APPLICATIONS.

MR. TALBOT is to be congratulated on having produced a book which must appeal strongly to the interest of the general reader, even though he may have no intention whatever of becoming a "kinematographer." A word here on this terrible term. It may be correctly derived from the Greek, while it certainly admits of many pronunciations, variously wrong, but the frequent collision with these six syllables when otherwise interested must impress upon the reader of Mr. Talbot's book the desirability of finding some new word of one syllable, not derived anyhow, such, for instance, as the mechanic and the electrician have found in the words crank and boost, so that neither attention may be arrested nor printing ink and paper wasted.

The main purpose of the book is to show what has been done in many different fields and the nature and cost of the apparatus which an amateur would be likely to use, rather than to give instruction in the details of the art. Incidentally, the commercial value of lucky-chance films of the amateur is pointed out, but it is not very clear what the cost of the unlucky-chance miles of film that will be worth nothing is likely to be.

On first opening the book the reader will see a picture of a fine cow which appears to have suffered at the hands of the cattle-maiming gang. Closer inspection will show that the injury is a door in the side of the beast, which, according to the legend below, is 15 ft. high. It was made by Messrs. Newman of *papier-mâché*, so that the operator might get inside with his camera with the intention of taking lions and other beasts unawares. Passing on from this testimonial to the credulity of the savage beast, we find numerous full-page or half-page enlargements of single pictures taken from the strip, so perfect in focus and detail that it is scarcely possible to believe that it has all been derived from a miniature $1 \times \frac{3}{4}$ in. only in size. A reference to some of these only will indicate the great variety of subject which is open to those who practise this new art. There are lions at lunch in the jungle, a polar bear diving in the arctic sea, birds feeding their young, a vulture preparing to fly, and taken at such close quarters that every feather is clearly defined, eighteen successive photographs taken during a single beat of a pigeon's wing, and fifteen of the opening of a convolvulus, both from the Marey Institute, two X-ray films from the same institute by M. Cavallo, one of sixty pictures showing digestion in the intestine of a frog, and thirty of the movements of the gizzard in a fowl, and others from the same quarter.

Then by the aid of the microscope and the "ultra-microscope," smaller forms of life may be seen in motion. For instance, there is the head of a spiny monster which is nothing more than a blue-bottle eating honey from off a needle, and there might have been, but are not, illustrations

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[1] "Practical Kinematography and its Applications." By Frederick A. Talbot. Pp. xii+262+plates. (London: W. Heinemann, 1913.) Price 3s. 6d. net.

of the blood corpuscles, phagocytes, and microbes in human blood in a state of violent activity and warfare. Then there is a group of pictures taken from an American film, which was produced with the object of showing the actual movements of a highly-skilled mechanic, so that those who take too long about their work might learn how to avoid useless movements. There is an account of the beautiful instrument of M. Bull described in NATURE of July 28, 1910 (vol. lxxxiv., p. 112), by means of which stereoscopic pictures may be taken at the rate of 2000 a second of such objects as a fly flying; and the somewhat similar apparatus of Prof. Cranz is also described. There is also an account of the most startling development of kinematography. It is called the "Life Target." In this device a moving picture is projected on the screen; it may be, for instance, of cavalry crossing the screen or of an elephant charging straight at the spectators. These are provided with rifles and shoot at the screen. The explosion wave, by suitable mechanism, causes the film to be arrested for an instant only, when the bullet hole is clearly seen as a white spot, which disappears when the film continues its movement. Other interesting pictures show the hatching of a chick, a fight between a lobster and an octopus, and many other things. A very good account is given of the construction of several of the simpler machines, and in particular of the "Aeroscope," or moving-picture camera, in which air previously compressed in a light tubular reservoir by means of a bicycle pump drives a minute engine and so moves the mechanism at the desired rate, while the operator, having both hands free, may hold the machine up over his head in a crowd and secure at close quarters some stirring incident. It is with this instrument that Mr. Cherry Kearton has obtained some of his most wonderful results.

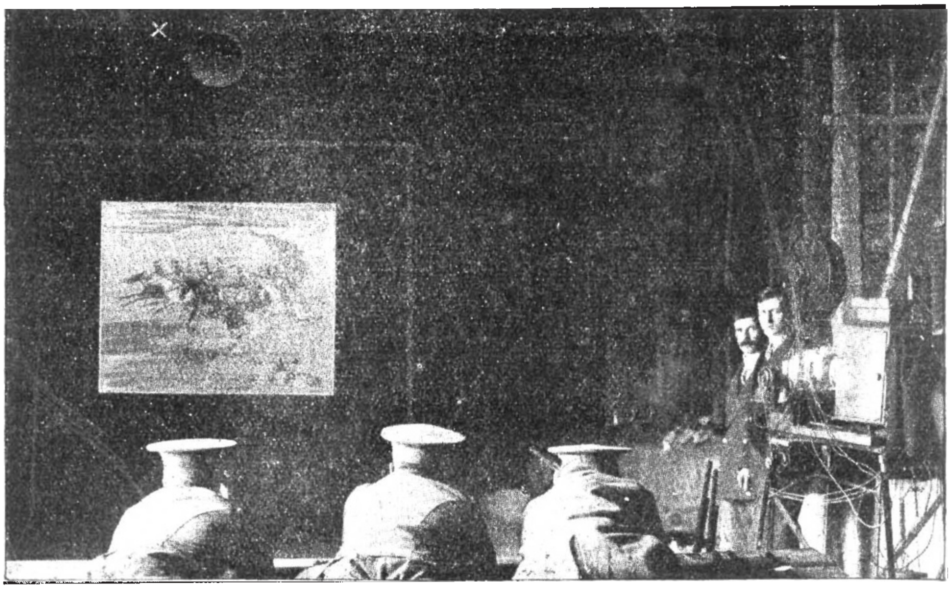

FIG. 1.—Soldiers firing at the "Life Target." The picture on the screen is thrown from the projector at right, and the picture is held stationary by the action of the report of the rifle caught by the microphone (marked ×) upon the lantern mechanism. From "Practical Kinematography and its Applications."

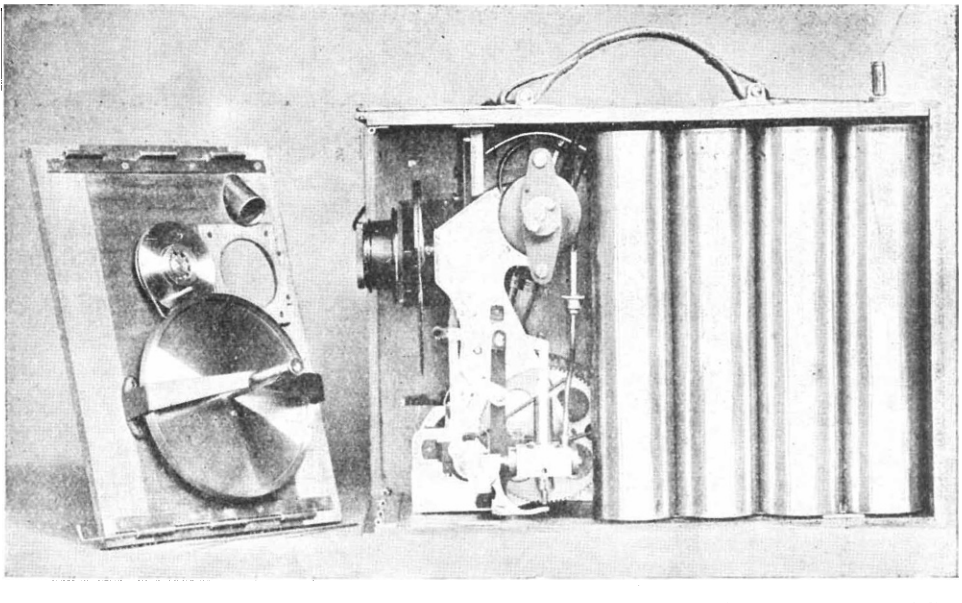

FIG. 2.—The compressed air reservoirs of the "Aeroscope" camera. One charge is sufficient to expose 600 ft. of film. From "Practical Kinematography and its Applications."

The methods used for developing and printing, of course, are described, but, curiously, no mention is made of colour work, whether two colour such as is so popular at the Scala Theatre, or three colour as represented a year or two ago at the Royal Institution by M. Gaumont, with such amazing fidelity to the colours of Nature.

Space is not available for more than a bare recitation of some of the things described or illustrated; sufficient, however, has been said to show that a most interesting and attractive book has been produced.

On p. 171 reference is made to a difficulty met with when photographing live microbes in consequence of their being killed by the heat from the concentrated beam from the powerful arc lamp. The use of a water cell in the beam is described as a method of reducing this trouble. While the ever-repeated fallacy of alum solution finds no place here, the author or Dr. Comandon, whose work is being described, do not appear to have known of the use of freshly-prepared solution of $FeSO_4$, of such a strength that its colour is just visible, as an effective heat absorber.

C. V. BOYS.

EARLY FOSSIL BRACHIOPODS.[1]

THE work before us, which treats of the Cambrian brachiopods of the whole world, must arouse the admiration of all who understand the difficulties of a comprehensive palæontological study of such magnitude. It is a splendid monument to the ability and perseverance of its eminent author, whose previous reputation as an investigator of the Cambrian faunas was so widely established as not to need the further proof afforded by these two handsome volumes. It is a matter both for surprise and congratulation that Dr. Walcott has found opportunity, amidst his many activities, to bring to completion a task so overwhelming: small wonder that it has occupied his available time for ten years or more.

If the wealth and good preservation of the Palæozoic Brachiopoda found in North America has provided an abundance of material favourable for study, how worthily have the palæontologists of the United States utilised their advantages! It may be granted that they owe some measure of their success to generous practical support and to freedom from conservative traditions in the matters of outlook and treatment of their subjects: these are advantages denied to most workers in Europe. Yet no consideration of such favouring circumstances can diminish our indebtedness to those brilliant investigators in the United States who have contributed so largely to the rapid advancement of modern palæontology in all its branches. For models of comprehensive systematic work, for suggestive and original phylogenetic studies, and for inspiring aid in applying the facts of palæontology to many problems of philosophic biology, we in Europe have become more and more accustomed to look westward. Dr. Walcott is one among several of his compatriots who have advanced our knowledge of the Palæozoic brachiopods in an extraordinary degree.

It is impossible for a single reviewer either to criticise in detail a work of such wide scope as the present monograph or to do justice to its merits. It must therefore suffice to indicate briefly some of its special features. In this book are described "44 genera, 15 subgenera, 477 species, and 59 varieties of Cambrian Brachiopoda," and "3 genera, 1 subgenus, 42 species, and 1 variety of Ordovician Brachiopoda." The descriptive part of the text occupies nearly 500 pages; yet, bearing in mind that this will remain the standard work of reference on the Cambrian brachiopods of all countries for many years to come, the author appears to have erred on the side of brevity. There are instances where the specific characters might with advantage have been set out more fully and the comparative observations amplified, though the appearance of an unduly meagre treatment may sometimes be owing to limitations in the material itself. The whole descriptive portion of the work affords ample evidence of the author's extensive knowledge and scholarly thoroughness. The 76 figures, chiefly in half-tone process, which are scattered throughout the text are clearly reproduced, while the letterpress is very well printed and edited.

The various tables in which are set forth synonymic references and the geographical and stratigraphical distribution of the brachiopods, are outstanding features of the work. The table of synonyms, giving the names now adopted set in a column alongside those previously applied to the same species, will be of great service to all workers in this field of study. Geographical distribution is shown in a synoptic table arranged according to continents and faunal provinces (pp. 114–122). Another elaborate table, giving the detailed stratigraphical distribution of the Cambrian and some Ordovician species, occupies 34 pages. This is arranged alphabetically according to states or countries, and contains a vast amount of concisely arranged information. Here are included summaries of many local or regional sections, with references to individual localities which are described in detail on subsequent pages: also lists of the brachiopods found at the various horizons and certain leading species of other classes.

The section of the work headed "Zoological Discussion" (pp. 291–326) is of importance to all students of the Brachiopoda. Here are to be found terminological definitions and an account of the morphological characters of the shells; also short chapters on evolution and classification, which strike us as unduly condensed. The bibliography (pp. 13–26) is very full, and should prove of great help to other workers. We miss here a reference to Mr. F. R. C. Reed's memoir on "The Cambrian Fossils of Spiti" (Palæontologia Indica), published in the summer of 1910, and the species of brachiopods there recorded are omitted from the descriptive portion of the text. Presumably that work appeared too late to be utilised;

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[1] "Cambrian Brachiopoda." By Charles D. Walcott. Monographs of the United States Geological Survey, vol. li.: part i., pp. 872+76 figs.; part ii., pp. 363+civ plates. (Washington: Government Printing Office, 1912.)